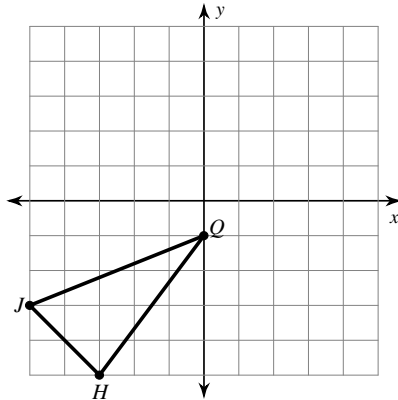


Rotations in The Plane

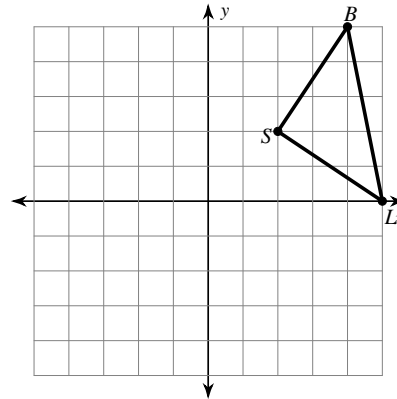
Part A

Graph the image of the figure using the transformation given.

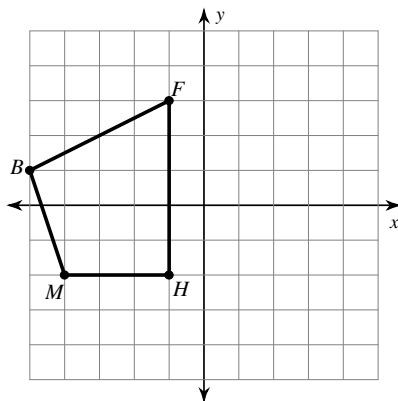
- 1) rotation 180° about the origin



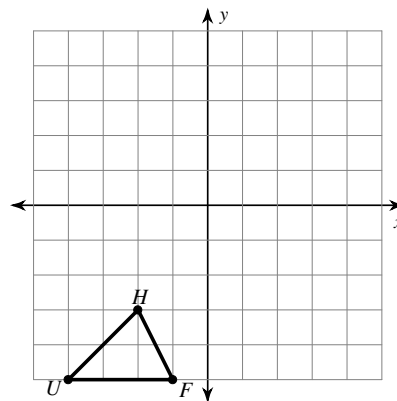
- 2) rotation 90° counterclockwise about the origin



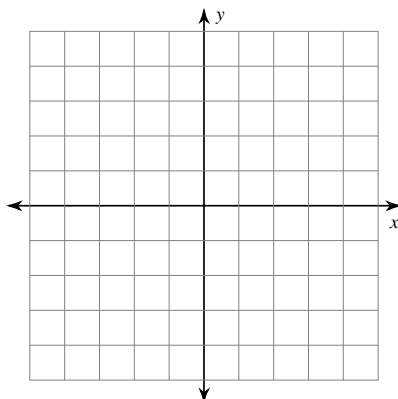
- 3) rotation 90° clockwise about the origin



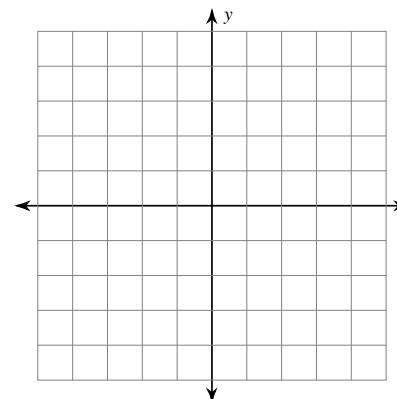
- 4) rotation 180° about the origin



- 5) rotation 90° clockwise about the origin
 $U(1, -2)$, $W(0, 2)$, $K(3, 2)$, $G(3, -3)$



- 6) rotation 180° about the origin
 $V(2, 0)$, $S(1, 3)$, $G(5, 0)$



Part B

Find the coordinates of the vertices of each figure after the given transformation.

7) rotation 180° about the origin

$Z(-1, -5)$, $K(-1, 0)$, $C(1, 1)$, $N(3, -2)$

8) rotation 180° about the origin

$L(1, 3)$, $Z(5, 5)$, $F(4, 2)$

9) rotation 90° clockwise about the origin

$S(1, -4)$, $W(1, 0)$, $J(3, -4)$

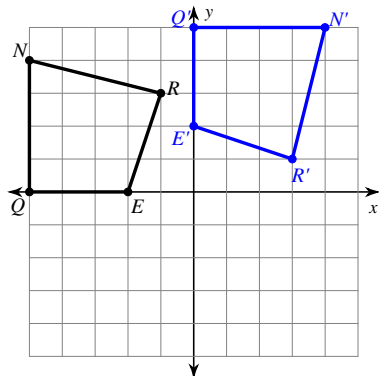
10) rotation 180° about the origin

$V(-5, -3)$, $A(-3, 1)$, $G(0, -3)$

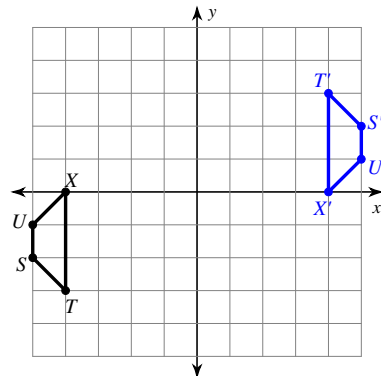
Part C

Write a rule to describe each transformation.

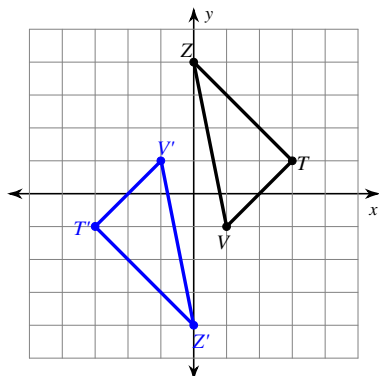
11)



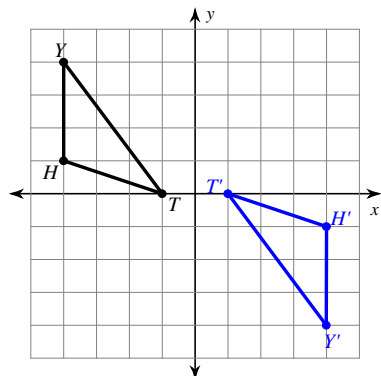
12)



13)

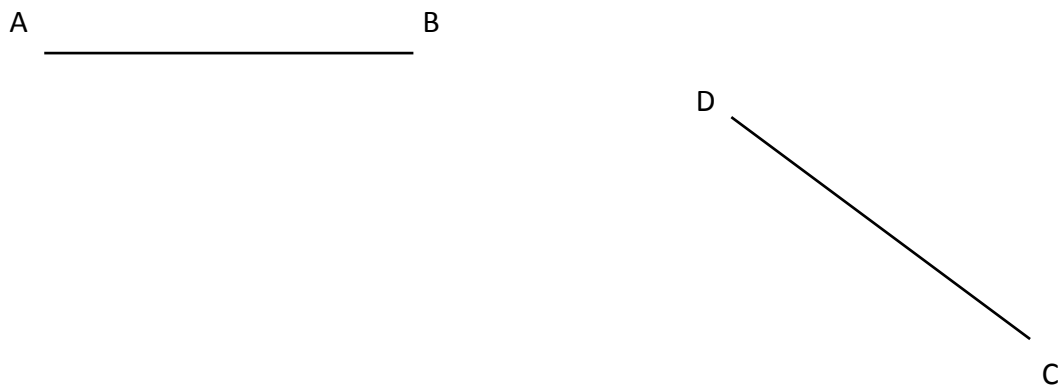


14)

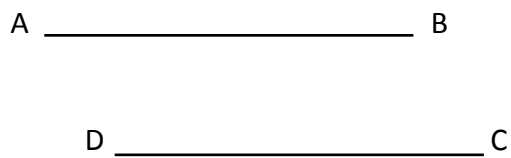


Part D

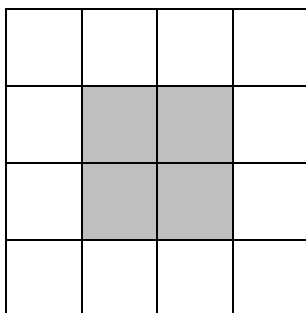
1. The line AB is rotated onto the line CD. Find the centre and angle of rotation.



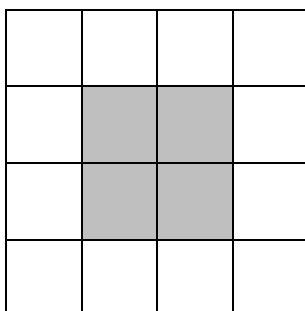
2. The line AB is rotated onto the line CD. Find the centre and angle of rotation.



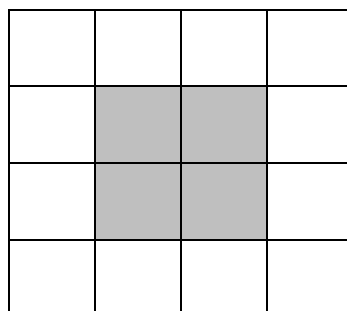
3. The shape below has a rotational symmetry of order 4.



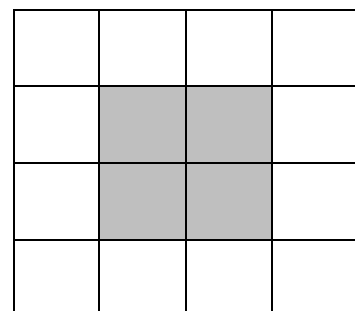
- (a) Shade in 4 more squares so the shape **still** has rotational symmetry of order 4
- (b) Shade in 4 more squares so the shape has rotational symmetry of order 2
- (c) Shade in 4 more squares so the shape still has rotational symmetry of order 1



(a)



(b)



(c)